

REMARKS

Claims 1-4, 6-29 and 39-41 are in the instant application of which claims 17 and 18 are cancelled without prejudice to reduce the issues; claims 1, 3, 4, 6, 8-16, 19-20, 23, 26, 27, 29, 40 and 41 are amended to more positively set forth applicants' patentably novel bending apparatus, and new claims 42 and 43 are added to set forth applicants' patentably novel bending apparatus in varying scope. No claims are allowed or indicated allowable.

Claims 29, 39 and 40 are objected to because line 17 of claim 29 on which claims 39 and 40 are dependent states in part "a shaped sheet between the first and second molds seals the to are closer to one another when in the first position" and the metes and bounds of the instant limitation can not be reasonably ascertained due to the grammatical errors.

Applicant has amended claims 29 and 40 to, among other things, correct the informality. Support for the amendments to claim 29 and 40 is found, among other places, in the pending claims. Based on the forgoing, applicant respectfully requests admission of the amendments to claims 29 and 40.

Claims 1-4, 6-16, 19, 20, 29, 39, 40 and 41 are rejected under 35 U.S.C. 112, first paragraph. Page 3, lines 8-10 states in part, that "the Examiner has found basis to support for the "marginal edge" as presently claimed." If basis is found, the claims should not be rejected. Applicants request clarification.

Applicant respectfully traverse the rejection of claims 1-4, 6-16, 19, 20, 29, 39, 40 and 41 under 35 U.S.C. 112, first paragraph; however to eliminate this issue the following action is taken. Claim 1 on which claims 2-4 and 6-16 are dependent is amended to recite, among other things,

the first mold having a major surface in facing relationship to the sheet supporting surface and the open area of the second mold and at least one passageway having a first end and an opposite second end; the major surface comprising a perimeter and a shaped press face surrounded by a boundary, the boundary of the shaped press face within, and spaced from, the perimeter of the major surface; the major surface having a marginal edge between the perimeter of the major surface and

the boundary of the shaped press face, and the marginal edge surrounding the shaped press face, wherein the shaped press face is a convex surface of a solid and the first end of the at least one passageway is at the marginal edge of the major surface of the first mold;

Claims 13 and 14 are amended to meet the requirements of 35 U.S.C. 112, first paragraph. Regarding claim 41, claim 41 is amended to, among other things delete the limitation " the wall mounts . . .and the first end of the at least one passageway."

Support for the amendments to claims 1, 13, and 41 is found, among other places, in Figs. 1 and 2 and the discussion on page 11, line 16 to page 12, line 23.

Claims 19 and 20 are amended to depend from claim 21. Regarding claim 29, on which claims 39 and 40 are dependent, the limitation of "air moving through the conduit can only enter interior of the chamber through the open area" is cancelled from claim 29. Support for the amendment to claim 29 is found, among other places, on page 33, lines 6-24.

Based on the forgoing, applicants respectfully request withdrawal of the rejection of claims 1-4, 6-16, 19, 20, 29, 39, 40 and 41 under 35 U.S.C. 112, first paragraph.

Claims 1-4, 6-16, 19, 20, 29, 39 and 40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regards as the invention. Applicant respectfully traverses the rejection of claims 1-4, 6-16, 19, 20, 29, 39 and 40 under 35 U.S.C. 112, second paragraph; however to eliminate this issue the following action is taken.

Claim 1 on which claims 2-4 and 6-16 are dependent is amended as discussed above, to more positively recite patentable features of the first mold. Claims 14 and 16 are dependent on claim 1, and are amended to, among other things, delete the term "portion." Claims 19 and 20 are amended to depend from

21. Claim 29 on which claims 39 and 40 are dependent is amended to delete the limitation "the enclosure."

Based on the forgoing, applicant respectfully requests withdrawal of the rejection of claims 1-4, 6-16, 19, 20, 29, 39 and 40 under 35 U.S.C. 112, second paragraph.

Claims 1, 2, 4, 6, 7, 12 and 41 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Montonen, U.S. Patent No. 5,383,947 (hereinafter also referred to as "Montonen"). Applicant respectfully traverses the rejection of claims 1, 2, 4, 6, 7, 12 and 41 as being under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Montonen; however, to eliminate this issue, independent claim 1 on which claims 2, 4, 6, 7 and 12 are dependent, dependent claims 4, 6, 7 and 12, and independent claim 41, are amended. More particularly, claim 1 is amended to recite a sheet bending apparatus, having, among other things:

a first shaping mold and an outline shaping mold defined as a second shaping mold, wherein

the second mold has a pair of spaced end rails and a pair of spaced central rails, the pair of spaced end rails and the pair of spaced central rails defining a boundary around an open area and portions of the end rails and the central rails providing a sheet supporting surface, and

the first mold having a major surface in facing relationship to the sheet supporting surface and the open area of the second mold and at least one passageway having a first end and an opposite second end; the major surface comprising a perimeter and a shaped press face surrounded by a boundary, the boundary of the shaped press face within, and spaced from, the perimeter of the major surface; the major surface having a marginal edge between the perimeter of the major surface and the boundary of the shaped press face, and the marginal edge surrounding the shaped press

face, wherein the shaped press face is a convex surface of a solid and the first end of the at least one passageway is at the marginal edge of the major surface of the first mold;

an outer wall having an inner surface, wherein the inner surface of the outer wall defines a boundary;

an elevator arrangement acting on at least one of the first and second molds to move the first and second molds and the outer wall relative to one another between a first position, wherein the first and second molds are spaced from one another and the outer wall is spaced from and out of contact with at least one of the first and second molds, and a second position, wherein the outer wall is in contact with the first and second molds to form an enclosure wherein the first shaping mold provides one side of the enclosure, the second mold provides an opposite side of the enclosure and the sheet supporting surface of the second mold and the first end of the passageway of the first mold are within the boundary defined by the outer wall, wherein the sheet supporting surface of the second mold is in facing relationship to the major surface of the first mold, and fluid communication between interior and exterior of the enclosure is provided through the open area, and the at least one passageway, and wherein with a sheet to be shaped in the enclosure, peripheral edge of the sheet to be shaped is spaced from the inner surface of the outer wall.

Support for the amendments to claims 1, 4, 6 and 12 is found, among other places, in Figs. 1 and 2, and the discussion on page 11, line 16 to page 12, line 23. Based on the forgoing, applicant respectfully requests admission of the amendments to claims 1, 4, 6 and 12, and consideration of claims 1, 2, 4, 6 and 12.

Montonen discloses an apparatus for bending glass sheets that includes a porous mold 2 above a glass sheet 1 supported on a ring mold 13. As clearly shown in Fig. 2, the wall 4 of Montonen contacts the periphery of the glass sheet

and does not contact the ring mold 13. Applicant's claim 1, on the other hand recites, among other things, that the first and second molds, and the outer wall are placed by an elevator arrangement in:

a second position, wherein the outer wall is in contact with the first and second molds to form an enclosure wherein the first shaping mold provides one side of the enclosure, the second mold provides an opposite side of the enclosure..., wherein with a sheet to be shaped in the enclosure, peripheral edge of the sheet to be shaped is spaced from the inner surface of the outer wall.

Since there are no teachings in Montonen that the wall 4 contacts the ring mold 13 to form an enclosure when a sheet is support on the ring mold 13, Montonen can not anticipate or render obvious the bending apparatus recited in claims 1, 2, 4, 6, 7 and 12.

Claim 41 is amended to recite a sheet bending apparatus having, among other things:

a first shaping mold having a major surface and a shaping member having a press face and a perimeter;

at least one passageway extending through the shaping member, the at least one passageway having one end terminating at the major surface of the first shaping mold adjacent to and outside the perimeter of the shaping member;

an outline shaping mold defined as a second shaping mold, the second mold having a pair of spaced end rails and a pair of spaced central rails, the pair of spaced end rails and the pair of spaced central rails defining a boundary around an open area and portions of the end rails and the central rails providing a sheet supporting surface;

an outer wall securely attached to the second mold, inner surface of the outer wall surrounding and spaced from the sheet supporting surface of the second mold, and

an elevator arrangement acting on at least one of the first and second molds to move the first and second molds relative to one another between a first position, wherein the first and second molds are spaced from one another and the outer wall is spaced from the first mold , and a second position, wherein the first and second molds, and the outer wall form an enclosure wherein the first shaping mold provides one side of the enclosure, the second mold provides an opposite side of the enclosure, and the inner surface of the outer wall surrounds the first end of the at least one passageway.

Support for the amendment to claim 41 is found, among other places, in Figs. 1, 2 and 4, and the discussion on page 11, line 16 to page 12, line 24, and page 15, lines 20-31. Based on the forgoing, applicant respectfully requests admission of the amendments to, and consideration of claim 41.

Claim 41 recites, among other things, that the outer wall is securely attached to the second mold. Applicant respectfully submits that there are no teachings in Montonen of having the outer wall 4 attached to the ring mold 13.

Based on the forgoing applicant respectfully requests withdrawal of the rejection of claims 1, 2, 4, 6, 7, 12 and 41 under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C 103(a) as obvious over Montonen.

Claim 3 dependent on claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Montonen as applied to claim 1 above, and further in view of Jacques U.S. Patent No. 5,437,703 (hereinafter also referred to as "Jacques"). Applicant respectfully traverses the rejection of claim 3 under 35 U.S.C. 103(a) as being unpatentable over Montonen as applied to claim 1 above, and further in view of Jacques, however, to eliminate this issue claim 3 is amended to, among other things, be consistent with the amendments to claim 1. Support for the amendment to claim 3 is found, among other places, in the pending claims. Based on the forgoing, applicant respectfully requests admission of the amendments to, and consideration of claim 3.

Claim 1 and Montonen were considered in the above discussion where applicant showed that Montonen did not anticipate or render obvious the subject matter of claim 1. Jacques does not cure the defects of Montonen because Jacques alone or in combination with Montonen fails to disclose an elevator arrangement to move an outer wall, a first mold and a second mold into a second position, wherein the outer wall is in contact with the first and second molds to form an enclosure wherein the first shaping mold provides one side of the enclosure, the second mold provides an opposite side of the enclosure, wherein a sheet to be shaped is in the enclosure and peripheral edge of the sheet to be shaped is spaced from the inner surface of the outer wall.

Based on the forgoing, applicant respectfully requests withdrawal of the rejection of claim 3 under 35 U.S.C. 103(a) as being unpatentable over Montonen as applied to claim 1 above, and further in view of Jacques.

Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Montonen as applied in the rejections of claim 1 above, and further in view of Skeen U.S. Patent No. 6,629,436B1 (hereinafter also referred to as "Skeen"). Applicant respectfully traverses the rejection of claims 8-11 under 35 U.S.C. 103(a) as being unpatentable over Montonen as applied in the rejections of claim 1 above, and further in view of Skeen. Claims 8-11 are dependent on claim 1, and are amended to, among other things, be consistent with the amendments to claim 1. Support for the amendment to claims 8-11 is found, among other places, in the pending claims. Based on the forgoing, applicant respectfully requests admission of the amendments to claims 8-19, and consideration of claims 8-11.

Claim 1 and Montonen were considered in the above discussion where applicant showed that Montonen did not anticipate or render obvious the subject matter of claim 1. Skeen does not cure the defects of Montonen because Skeen alone or in combination with Montonen fails to disclose an elevator arrangement to move an outer wall, a first mold and a second mold into a second position, wherein the outer wall is in contact with the first and second molds to form an enclosure wherein the first shaping mold provides one side of the enclosure, the

second mold provides an opposite side of the enclosure, and a sheet to be shaped is in the enclosure with peripheral edge of the sheet to be shaped spaced from the inner surface of the outer wall.

Based on the forgoing, applicant respectfully requests withdrawal of the rejection of claims 8-11 under 35 U.S.C. 103(a) as being unpatentable over Montonen as applied in the rejection of claim 1 above, and further in view of Skeen.

Claims 13-16, 19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Montonen in view of Posney U.S. Patent No. 5,437,703 (hereinafter also referred to as "Posney"). Applicant respectfully traverses the rejection of claims 13-16, 19 and 21 under 35 U.S.C. 103(a) as being unpatentable over Montonen in view of Posney. Claims 13-16 are dependent on claim 1 and are amended to, among other things, be consistent with the amendments to claim 1. Support for the amendments to claims 13-16 is found, among other places, in the pending claims. Based on the forgoing, applicant respectfully requests admission of the amendments to, and consideration of claims 13-16.

Claim 1 and Montonen were considered in the above discussion where applicant showed that Montonen did not anticipate or render obvious the subject matter of claim 1. Posney does not cure the defects of Montonen because Posney alone or in combination with Montonen fails to disclose an elevator arrangement to move an outer wall, a first mold and a second mold into a second position, wherein the outer wall is in contact with the first and second molds to form an enclosure wherein the first shaping mold provides one side of the enclosure, the second mold provides an opposite side of the enclosure, with a sheet to be shaped in the enclosure and peripheral edge of the sheet to be shaped spaced from the inner surface of the outer wall.

Consider now claims 19 and 21. Independent claim 21 is amended to more positively recite applicant's patentably novel sheet bending apparatus; claim 19 is amended to, among other things, be consistent with the amendment

to claim 21. Claim 21 recites a sheet bending apparatus having, among other things,

a first shaping mold having a major surface, a perimeter, a portion of the major surface within and spaced from the perimeter comprising a shaping member having a predetermined shaped press face; a first plurality of passageways having a first end in the major surface of the first shaping mold between the perimeter of the first shaping mold and the shaping member, and a second plurality of passageways having a first end at the shaped press face of the shaping member of the first shaping mold, wherein opposite second end of the first plurality of passageways is in fluid communication with a first chamber, and opposite second end of the second plurality of passageways is in fluid communication with a second chamber;

an outline shaping mold defined as a second shaping mold, the second mold having a pair of spaced end rails and a pair of spaced central rails, the pair of spaced end rails and the pair of spaced central rails defining a boundary around an open area, wherein portions of the end rails and the central rails provide a sheet supporting surface;

an outer wall between the first and second molds, inner surface of the outer wall defining a boundary;

an elevator arrangement acting on at least one of the first and second molds to move the first and second molds relative to one another between a first position, wherein the first and second molds are spaced from one another and the outer wall is spaced from at least one of the first and second molds, and a second position, wherein the first and second molds, and the outer wall form an enclosure, wherein the sheet supporting surface of the second mold and the first end of the first plurality of passageways are within the boundary defined by the inner surface of the outer wall, wherein the first shaping mold provides one side of the enclosure, and the second mold provides an opposite side of the enclosure with the sheet supporting surface of the second mold and

the first end of the second plurality of passageways in facing relationship to one another, and ambient air is accessible to the enclosure at least through the open area of the second mold;

wherein the first plurality of passageways provide fluid communication between the first chamber and the interior of the enclosure; the second plurality of passageways provide fluid communication between the second chamber and interior of the enclosure, and each of the first end of selected ones of the second plurality of passageways has a first part and a second part, wherein the first part has an opening at the press face that has a shape and size at surface of the press face that remains constant and for a predetermined distance from the surface of the press face, and the second part has an opening that is smaller than the opening of the first part to provide a stepped recess in the press face, and

a plate having a plurality of spaced holes therethrough mounted in the stepped recess.

Support for the amendments to claims 19 and 21 is found, among other places, in the pending claims, Figs. 11 and 12, and page 23, lines 5- 30. Based on the forgoing, applicant respectfully requests admission of the amendments to claims 19 and 21, and consideration of claims 19 and 21.

Applicant respectfully submits that there are no teachings in Montonen and/or Posney of an end of a passageway in a shaping mold having the features recited in claim 21 which include, among other things,

a first part and a second part, wherein the first part has an opening at the press face that has a shape and size at surface of the press face that remains constant and for a predetermined distance from the surface of the press face, and the second part has an opening that is smaller than the opening of the first part to provide a stepped recess in the press face, and a plate having a plurality of spaced holes therethrough mounted in the stepped recess.

Since there are no teachings in Montonen and/or Posney of a press face having a plate with a plurality of holes in a stepped recess, they can teach the subject matter of claims 19 and 21.

Based on the forgoing, applicant respectfully requests withdrawal of the rejection of claims 13-16, 19 and 21 under 35 U.S.C. 103(a) as being unpatentable over Montonen in view of Posney.

Claims 20, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Montonen and/or Posney as applied to claims 1 and 21 above, and further in view of Vanhuysee U.S. Patent No. 5,276,173B1 (hereinafter also referred to as "Vanhuysee"). Applicant respectfully traverses the rejection of claims 20, 22 and 23 under 35 U.S.C. 103(a) as being unpatentable over Montonen and/or Posney as applied to claims 1 and 21 above, and further in view of Vanhuysee.

Claim 22 is dependent on claim 21, and claim 20 is amended to depend from, and to be consistent with claim 21. Claim 21, Montonen and Posney were considered above and applicant showed that Montonen and/or Posney do not anticipate and/or disclose the subject matter of claim 21. Vanhuysee does not cure the defects of Montonen and/or Posney because Vanhuysee alone or in combination with Montonen and/or Posney fail to teach an end of a passageway in a shaping mold having the features recited in claim 21 which include the first end of a passageway, having, among other things,

a first part and a second part, wherein the first part has an opening at the press face that has a shape and size at surface of the press face that remains constant and for a predetermined distance from the surface of the press face, and the second part has an opening that is smaller than the opening of the first part to provide a stepped recess in the press face, and a plate having a plurality of spaced holes therethrough mounted in the stepped recess.

Consider now claim 23. Claims 23 is dependent on claim 1 and is amended to, among other things, be consistent with claim 1. Support for claim 20 is found, among other places, in the pending claims. Based on the forgoing, applicant respectfully request admission of the amendments to, and consideration of, claim 23.

Claim 1 and Montonen were considered in the above discussion where applicant showed that Montonen did not anticipate or render obvious the subject matter of claim 1. Posney does not cure the defects of Montonen because Posney alone or in combination with Montonen fails to disclose an elevator arrangement to move an outer wall, a first mold and a second mold into a second position, wherein the outer wall is in contact with the first and second molds to form an enclosure wherein the first shaping mold provides one side of the enclosure, the second mold provides an opposite side of the enclosure, wherein with a sheet to be shaped in the enclosure, peripheral edge of the sheet to be shaped is spaced from the inner surface of the outer wall.

Based on the forgoing, applicant respectfully requests withdrawal of the rejection of claims 20, 22 and 23 under 35 U.S.C. 103(a) as applied above to claims 1 and 21, respectively, and further in view of Vanhuysee.

Claims 24-29, 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Montonen in view of Kuster U.S. Patent No. 5,713,976 (hereinafter also referred to as "Kuster"). Applicant respectfully traverses the rejection of claims 24-29, 39 and 40 under 35 U.S.C. 103(a) as being unpatentable over Montonen in view of Kuster.

Claims 24-28 are directly or indirectly dependent on claim 1, and claims 26 and 27 are amended to, among other things, be consistent with amended claim 1. Based on the forgoing, applicant respectfully requests admission of the amendments to claims 26 and 27, and consideration of claims 24-28.

Claim 1 and Montonen were considered in the above discussion where applicant showed that Montonen did not anticipate or render obvious the subject matter of claim 1. Kuster does not cure the defects of Montonen because Kuster alone or in combination with Montonen fails to disclose an elevator arrangement

to move an outer wall, a first mold and a second mold into a second position, wherein the outer wall is in contact with the first and second molds to form an enclosure wherein the first shaping mold provides one side of the enclosure, the second mold provides an opposite side of the enclosure, wherein with a sheet to be shaped in the enclosure, peripheral edge of the sheet to be shaped is spaced from the inner surface of the outer wall.

Claims 39 and 40 are dependent on claim 29. Claim 29 is amended to more positively recite applicant's patentably novel sheet bending apparatus, which includes, among other things:

- a chamber having outer walls, and an entry into interior of the chamber;

- a first shaping mold mounted in the chamber, the first shaping mold having a press face having a predetermined shape;

- an outline shaping mold defined as a second shaping mold mounted in the chamber in facing relationship to the press face of the first mold, the second mold having a pair of spaced end rails and a pair of spaced central rails, wherein portions of the end rails and the central rails provide a sheet supporting surface with an open area within the boundary of the sheet supporting surface;

- an elevator arrangement acting on at least one of the first and second molds to move the first and second molds relative to one another between a sheet receiving position where the first and second molds are spaced a first distance from one another, and a sheet pressing position where the first and second molds are spaced a second distance from one another, wherein the first distance is greater than the second distance ;

- a vacuum pump connected to the interior of the chamber to remove air from the interior of the chamber, and

- a conduit having a first end connected to the open area between the shaping rails of the second mold, an opposite second end outside the chamber, and a portion of the conduit between the first and second ends of the conduit extending through one of the outer walls of the chamber to move

air through the conduit to the open area of the second mold, wherein the open area is closed when the first and second molds are in the sheet pressing position and at least one sheet is between the press face of the first mold and the supporting surface of the second mold whereby removal of air from the interior of the chamber by the vacuum pump increases the air pressure in the conduit below the at least one sheet to bias the at least one sheet against the press face of the first mold.

Support for the amendments to claims 29 and 40 is found among other places, in Fig. 17 and the discussion on page 33, lines 6-24. Based on the forgoing, applicant respectfully requests admission of the amendments to claims 29 and 39, and consideration of claims 29, 39 and 40.

Applicant respectfully submits that there are no teachings in Montonen and/or Kuster of a sheet bending apparatus having, among other things, an elevator arrangement acting on a first mold or a second mold to move the first and second molds relative to one another; a vacuum pump connected to the interior of the chamber to remove air from the interior of the chamber, and a conduit having a first end connected to the open area between the shaping rails of the second mold, an opposite second end outside the chamber. A portion of the conduit extends through one of the outer walls of the chamber to move air through the conduit to the open area of the second mold, wherein the open area is closed when the first and second molds are in the sheet pressing position and at least one sheet is between the press face of the first mold and the supporting surface of the second mold. The removal of air from the interior of the chamber by the vacuum pump increases the air pressure in the conduit below the at least one sheet to bias the at least one sheet against the press face of the first mold.

There are no teachings in Montonen and/or Kuster of a shaping mold having rails defining an open area mounted in an enclosure; a conduit connecting the open area to the exterior of the chamber such that removing the air from the chamber increases air pressure in the conduit. Since Montonen and/or Kuster

fail to teach this feature of applicant's sheet bending apparatus, they can not teach the subject matter of claims 29, 39 and 40.

Based on the forgoing, applicant respectfully requests withdrawal of the rejection of claims 24-39, 39 and 40 under 35 U.S.C. 103(a) as being unpatentable over Montonen in view of Kuster. Further, based on the forgoing, applicant respectfully requests allowance of claims 1-4, 6-16, 19-29 and 39-41.

Applicant has added new claims 42-44. Claims 42 and 43 are dependent on claim 1, and claim 44 is dependent on claim 21. Support for new claims 42-44 is found, among other places, in the pending claims. The arguments put forth to patentably distinguish claims 1 and 21 over the art are applicable, among others, to patentably distinguish claims 42-44 over similar art. Based on the forgoing, applicant respectfully requests admission of, consideration of, and allowance of, claims 42-44.

This amendment represents a sincere effort to place this application in condition for allowance. In the event issues remain, the Examiner is invited to call Mr. Andrew Siminerio at 412-434-4645 or the undersigned to discuss those issues before further action regarding the application is taken.

Respectfully submitted,

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